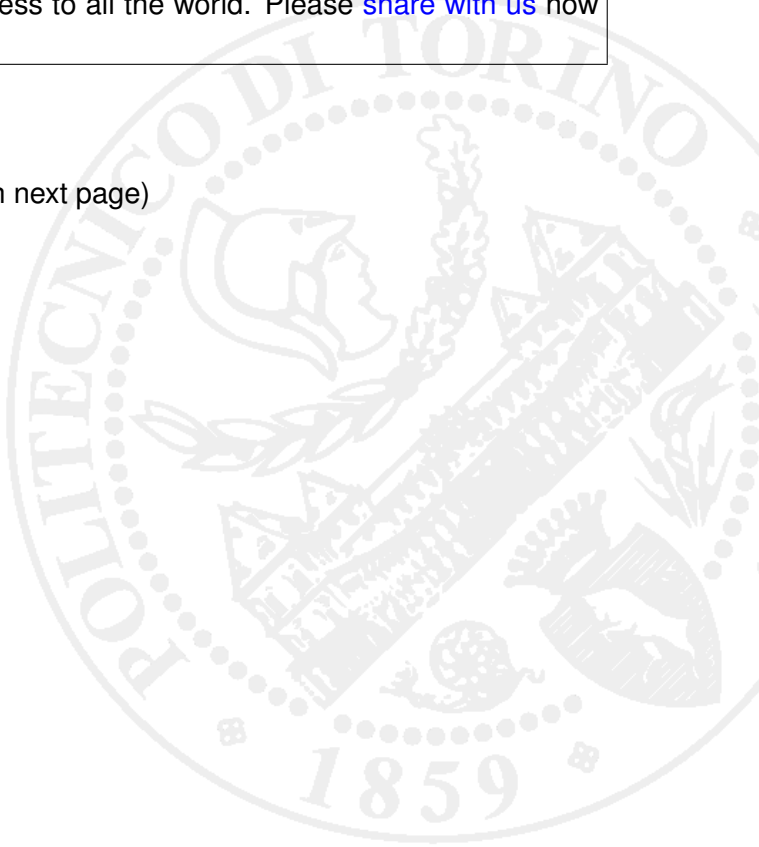
[Article] The Anthropozoic Era: Excerpts from Corso di Geologia



The Anthropozoic Era: Excerpts from *Corso di Geologia* (Miliano: G. Bernardoni E. G. Brigola, Editori, 1873)

by Antonio Stoppani, translated by Valeria Federighi,
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Introduction

by Valeria Federighi and Etienne Turpin

The Italian geologist Antonio Stoppani is a remarkable but little-known figure in the history of science and the theoretical humanities.[1] Recently, following debates about the Anthropocene initiated by the Dutch chemist Paul Crutzen, some scholars have returned to Stoppani's writing for its eloquent argument regarding the appearance of human activity in the archive of deep time—the earth. Born in Lecco in 1824, the young Stoppani studied to become a priest of the Rosminian order, and was ordained in 1848. In the same year, Stoppani participated in the resistance during the Cinque giornate di Milano (Siege of Milan), where he both fought on the barricades and, fantastically, invented and fabricated aerostats that were used to communicate with the periphery and the provinces, sending revolutionary messages to the countryside from inside a barricaded Milano. In this endeavour, he was helped by the typographer Vincenzo Guglielmini, who worked with Stoppani to ensure that the aerostat balloons would travel from the Seminario Maggiore di Porta Orientale over the walls erected around the city (and the Austrians trying to shoot them from the sky) to encourage Italians to revolt against the Austrian Empire.

Following this siege, Stoppani also participated in subsequent confrontations, but following the Battle of Novara in 1849 he returned to the seminary as grammar teacher. This return was short lived, however, because Stoppani's patriotic past and political ideas remained unwelcome by the Church. Following his expulsion from the seminary, he began to study geology, and, while his religious conviction is clear and consistent in his writings on geology, it is for his advances in understanding terrestrial affairs, not theological dogma, that he is best remembered. Notably, after the liberation of Milan, Stoppani's merits were acknowledged and his old titles reinstated. In 1867, he was appointed Professor of Geology at the Politecnico di Milano, where he also helped to found the Museum of Geology, and

acted as president of the Geological Society. An experienced alpinist, in 1874 Stoppani became the first president of the Milan section of CAI (Club Alpino Italiano).

In the late 1880s, Stoppani would return to and confront his theological roots, publishing *Gli intransigenti*—a book critical of the Catholic Church and its resistance to political and social change—which prompted attacks from *L'Osservatore Romano*. Later, in his ethnographic study of the various places and populations that inhabited the recently unified Italian territory, *Il bel paese*, Stoppani would wonder at the diversity of tellurian physical expression: "Italy is almost—I don't stammer in saying this—the synthesis of the physical world." The excerpt below, translated from Stoppani's three-volume *Corso di Geologia* of 1873, is exemplary of its breadth of knowledge, courageous imagination, and compelling but accessible rhetorical inventiveness. Nearly 13 decades before Crutzen's coinage of the Anthropocene, in this text we find an untimely assessment of the human relation to deep time; perhaps, in the wake of these more recent debates and the more evident excesses of human productivity, we finally have ears to hear him.

The Anthropozoic Era

Excerpts from *Corso di Geologia*
by Antonio Stoppani

Those formations, which are about to present us with a great new era, are for geologists nothing more than a last, minor appendix of Quaternary terrains on which we have founded the Neozoic. I anticipate there will be an outcry; they will protest against a supposed violation of all laws of proportion, whereas those terrains add little more than a small fraction to the great masses that compose the history of the earth's crust, and represent a very short period in the history of the world. Much more indignant will be those (they are not, by good luck, those who have greater voice in the matter) that declare the tertiary man, and in the sovereign creature of the universe only see the base descendant of

an ancient quadrumana. To answer only the former (those that will be scandalized because I propose to raise to the dignity of an era a period that would escape recognition by its tenuity, when, for instance, compared to the Paleozoic era), I will refer them to what I said at the beginning of the previous chapter.

Whenever, I repeat, have epochs been divided based on their sheer length? Is it not true, as I said, that for divisions in history, not the period's duration, but the importance of its happenings, has always been the meter? Reinforcing the comparison between history and geology, and speaking of the Anthropozoic era in particular, it is necessary to reflect on how the introduction of a new element, a new force—that gave humanity or a nation a new input, that separated the new from the old, building on the ruins of an ancient political, intellectual, or moral edifice the foundations of a new one—served especially for the purpose of dating the epochs of both universal and particular histories.

I recall with pleasure the event which we believe opened the vulgar era. When was it that (more for a necessity as felt by the universe, than for a convention accepted by historians of all nations) we began to count years anew, and we established the two eras in which we partition universal history? This happened when in the world resounded the great Word; when, in the bosom of the aged fabric of ancient pagan societies, the Christian ferment was introduced, the new element *par excellence*, that substituted ancient slavery with freedom, darkness with light, fall and degeneration with rebirth and the true progress of humanity.

It is in this sense, precisely, that I do not hesitate in proclaiming the Anthropozoic era. The creation of man constitutes the introduction into nature of a new element with a strength by no means known to ancient worlds. And, mind this, that I am talking about physical worlds, since geology is the history of the planet and not, indeed, of intellect and morality. But the new being installed on the old planet, the new being that not only, like the ancient inhabitants of the globe, unites the inorganic and the organic world, but with a new and quite mysterious marriage unites physical nature to intellectual principle; this creature, absolutely new in itself, is, to the physical world, a new element, a new telluric force that for its strength and universality does not pale in the face of the greatest forces of the globe.

Geology, too, feels thrust onto a new path, feels that its most powerful means, its surest criteria, fail; it becomes, too, a new science. Already the Neozoic era forced it to walk a very different path than that which it had walked when it only narrated the most ancient events. The science of ancient seas was already destined to become the science of new continents. But even this road cannot lead geology to its destination. It is not enough to consider earth under the impetus of telluric forces anymore: a new force reigns here; ancient nature distorts itself, almost flees under the heel of this new nature. We are only at the beginning of the new era; still, how deep is man's footprint on earth already! Man has been in possession of it for only a short time; yet, how many geological phenomena may we investigate, not in telluric agents, atmosphere, waters, animals, but instead in man's intellect, in his intruding and powerful will? How many events already bear the trace of this absolute dominion that man received from God when, still innocent, first heard those words: *Be fruitful and multiply, fill up the earth and subdue it; and rule over the fish of the sea, the bird of the sky and every living thing that moves on the earth,* and when, guilty, he heard said: *You will earn your bread with your sweat*?

To understand how deep the changes brought about on the globe by this new element are, and how new, consequently, the criteria that guide science should be, it should suffice to make a comparison between so called virgin lands (if there are still any that deserve that name) and those that have been cultivated for centuries. Let us look at Europe, where man has pushed his dominion most forward and where, although recent, his footprints are the deepest.

If his power could do nothing against the strength of the winds, which lead seawaters into the fields that he farms, nonetheless he extends his dominion over the waters themselves as soon as they sprout from the cumuli that wander in the atmosphere. From the humble brook, that springs from cliff to cliff, to the river that widens its mouth as it debouches into the sea, all flowing waters, oblivious of ancient laws, beat the path that man has traced for them.

The old alluvial expanses, already beaten by them with whirling winding, and drowned by their overflowing floods, subtracted by force to their capricious domain, are converted into greening meadows and fertile fields, periodically mowed by their new owner. Where natural valleys truncate, artificial valleys begin that man traced, guiding gigantic banks along lines as long as are those dug by the slow labour of centuries; and if a river, in the end, finds anew the bosom of the ancient sea, it will be through a different mouth. Waters are not safe, even when they flow furtive underground. Man chases them, catches them, then fountains and rivers, on which man imposes the name of wells, quench the flock's thirst and irrigate the desert. At the same time he severs springs to the exuberant superficial waters, and disperses them into his cisterns.

Already there are new mountains, where old valleys used to be: already the irregular soil is drawn into wide plains where waters extend into a thin veil. Already the impenetrable Alps have heard the chisel and the mine resonate in their bosom, and nations have kept a lookout in order to brotherly shake hands. Everywhere, the bosom of the ancient Mother discloses, and the shadows, broken by vagrant splendours, resign to man treasures that were hidden by centuries. At times you can see this Prometheus awaken fire from the bowels of the earth, and guide it to his furnace. Rival of the potent agents of the internal world, man undoes what nature has done. Nature has worked for centuries at agglomerating in the bowels of the earth oxides and metallic salts; and man, tearing them out of the earth, reduces them to native metals in the heat of his furnaces. In vain you would look for a single atom of native iron in the earth: already its surface is enclosed, one could say, within a web of iron, while iron cities are born from man's yards and float on the sea. How much of the earth's surface by now disappears under the masses that man built as his abode, his pleasure and his defense, on plains, on hills, on the seashores and lakeshores, as on the highest peaks! By now the ancient earth disappears under the relics of man or of his industry. You can already count a series of strata, where you can read the history of human generations, as before you could read in the amassed bottom of the seas the history of ancient faunas. To the archeolithic strata, where human relics appear as buried among cut firestones and the bones of disappeared animals, terramare superimpose, and pile dwellings; this is where the progress of human race is testified by bronze forged into exquisite weapons and tools. Yet we have not come to see the soil imprinted upon by Etruscan art; and to find ourselves on our own, we have to cross the immense stratum that carries the mark of Roman genius. The rivers, almost oblivious to old granite and porphyry pebbles, learned how to roll pottery and crockery. In the end, approximately 300 million are the men that work, bent and sweaty, from morning until night, on the soil of this small parch of the earth's surface that is called Europe. England, where

human industry is the most fervent, crumbles and caves in, everywhere eaten through by insatiable coal, rock salt, limestone, and metal miners. What will happen, when Europe will all be worked through as England, and the whole world as Europe? Furthermore, man's influence is not limited to dry land. The very sea cannot escape his dominion. It recedes already, pushed back by obtrusive dams, pumps, and joints that steal from it arms and lagoons and swamps to make fields. Neither is its immensity of any help in dividing land from islands, islands from continents, as thousands and thousands of ships have opened the way through which nations can embrace, and lands exchange products of the three kingdoms in mutual tribute. Even the unexplored depths of the ocean were forced to act as intercessor, in order to put in contact the peoples of the two worlds. And man invades the atmosphere as well, and not content to only pour, as animals do, the products of his respiration into it, he also pours vast amounts of the products of his industry, gases from his fires and his grandiose laboratories. A century, or just a year, since a family of men settles onto virgin soil, and everything is changed, everything breathes with the strength of human intelligence.

So man dominates over inorganic matter and over forces that alone had governed him for innumerable centuries; but his yoke does not spare the other, nobler kingdoms. The iron law that his sin brought upon him made man essentially, among other diverse names, a farmer. Here he razes woods; there he covers bare lands with woods; wood is turned into tools; logs into poles; deserts become meadows; squalid moors, verdant fields; nude hills, vineyards and gardens. Greens are not allowed to grow haphazardly any longer, nor to agglomerate into messy and nameless groups. Arranged in rows, seeded in beds, grouped in woods that take their names from the essence that man planted there, cut, pruned, tormented in innumerable guises, fed by artificial heats and waters, they testify everywhere that man has taken full control of that kingdom which God has allocated him for food and shelter. Neither, under his irresistible strength, have plants only submitted to a regime that nature had not imposed; but, oblivious to their own primitive nature, bowing to forced matrimony, new species are simulated under the horrific mask of hybridism, while others lie with the flowers and fruits that grafting created. Botanists can only look into the furthest depths, into mountains' fissures, on the highest peaks, for the untamed daughters of virgin nature, which carry unaltered the features of their Mother.

One of the laws that gave geologists the surest criteria to understand conditions of the earth in ancient eras, and that seemed to be even stronger in the current era because of the stricter partitioning among lands and climates, is by man powerfully violated. I am talking about the geographical distribution of plants and animals. Torn away from native soil, servant to the needs and pleasure of he who holds empire on earth, how many plants were brought to usurp, through forced theft, our native plants' place! Without coming to a very late age, we witnessed the arrival, in Europe, of many of them, and many others were seen by just past generations, which wondered at the discovery of a new world. Many of these imported ones have already overcome the indigenous rulers of the soil. Huge expanses of our fields are covered in corn (*Zea maïs*), originally from South America; in potatoes (*Solanum tuberosum*) from the same region; in tomatoes (*Lycopersicon esculentum*) that with his vulgar name, similar to that of *Tomats* that carries in its native land, recalls Mexico, from where, in exile, it came to us. North America gave us false acacia (*Robinia pseudoacacia*) and *spina Christi* (*Gleditsia triacanthos*, or honey locust), naturalized to the point of becoming a pest to our own. To these plants of North America we should add maple (*Negundo fraxinifolium*).

Other species came from the farthest regions of the ancient world in times so remote that no one can suspect them not to be our own since they have been with us for so many centuries. Amongst these, beans (*Phaseolus vulgaris*) with their infinite variations, and pumpkins and melons (*Cucurbita maxima, C. pepo*), also well varied, came from the Eastern Indies. Asia also provided us with fava beans (*Vicia faba*) and spinach (*Spinacia oleracea*). From the plateaus of Central Asia came common garlic (*Allium sativum*): from China, with silkworms, the mulberry tree (*Morus alba*); from the East, probably from Persia, the peach tree (*Persica vulgaris*); from Asia and northern Africa, the almond tree (*Amygdalus communis*); from Asia also, Indian chestnut (*Aesculus hippocastanum*); from Japan, Paper Mulberry (*Broussonetia papyrifera*), which now grows spontaneously along creeks and among rubble; from Asia Minor, the grape vine (*Vitis vinifera*), which, grown everywhere in its infinite varieties, now also sprouts independently in woods and along bushes. For his pleasure, then, man transplanted roses from Asia (*Rosa centifolia*, *damascene*, *indica*); from Peru the sunflower (*Helianthus annuus*); from Mexico the dahlia (*Dahlia variabilis*); from the Orient lilies (*Lilium candidum*); from India touch-me-nots (*Balsamina hortensis*); from the Cape of Good Hope geraniums (*Pelargonium Zonale*, *inquinans*, etc.). What will happen now that exotic plant export has become an extremely active branch of commerce, favoured by all these recoveries in speculation, science, and luxury? Now that our greenhouses present us with as many glimpses of the torrid zone, and that our gardens disdain every flower that does not carry a foreign name? Not always has man been a voluntary tool of such a radical revolution in the geographic distribution of plants. He carried rice from the Eastern Indies; and, immediately among our own paddies an Indian flora sprouted, which had followed furtively the main plant on its far exile. Many times indeed man made complaints over this potency of his that so widely exceeded his own will. Among the seeds that he, oblivious, transports with wools, timber, with every good, how many became pests! Among the most common grasses that are a blight to our fields and meadows, we can count the *Erigeron canadensis* and *Stimatix annua*, which came from North America. From North America also came, on ships that carried timber, the *Elodea canadensis* that took over fresh waters throughout Europe, and recently pushed its invasions to the rivers and channels of Belgium, France, Germany to such a point that is often makes boats go aground.

European man, on the other hand, almost to compensate for his thefts, disseminates elsewhere those plants through which he has, in every way possible, enriched his soil. Many species, indigenous to Europe, found themselves in this way cultivated in large scale in other parts of the world, and the new continent was opened to all the plants that inhabited the old. In this way rice, sugarcane, coffee, indigo (*Indigofera anil*), beans, fava beans, wheat, rye, coming from various countries, were harvested there. Oats (*Avena sativa*), carried to Montevideo, found the soil so propitious that they grew in vast grazings very much similar to sewn fields. The endless *pampas* were covered in cardoons (*Cynara cardunculus*) and thistles (*Carduus marianus* and others). Violets (*Viola adorata*), borage (*Borago officinalis*), marrubium (*Marrubiumvulgare*), nettles (*Urtica urens*, *dioica*), mallows (*Malva sylvestris*, *rotundifolia*), accompanying man in his fortuitous peregrinations across the Atlantic, grew abundantly in the colonies of South America, where they propagated to the detriment of not a few indigenous species. Thus, a little at a time, local floras are substituted by a universal flora, deriving from their mixing. It is a new event

in the history of the world, of which the geologist cannot find any explanation in climate conditions, in the nature of soils, nor even in the laws dependent on a primitive act of creation, but in the boundless influence that, whether he likes it or not, man exercises over telluric nature.

The same dominion, maybe even more effective and absolute, man exercises on the highest of nature's three kingdoms. From the first moment of creation, with sovereign gaze, he reviewed earth's beasts. In animals he only saw the usefulness or the damage that they could bring him. He threatened extermination for the harmful, and serfdom for the useful. European man, immigrant from Asia, carried with him without exception (zoologists agree on this) all domestic animals, the use of which is lost in the darkness of prehistoric eras. Their relics are only found alongside the relics of man. Those domestic animals—under the different influences of climate and other local conditions, and more yielding to man's creator strength, multiplying out of all proportion on our soil—underwent so many modifications that European fauna (differently from ancient faunas of every land) presents us rather with a world of varieties more than with a series of species. Suffice it to recall by imagination the most domesticated animals: they have such different forms, dimensions, colours, instincts and habits that we strive to distinguish them through various appellatives and nouns. The naturalist will count species on the fingers of his hand, while we dish out a dictionary of names and adjectives: we cite a hundred species of domestic dogs, while he only recognizes one dog, as he only does one cat, one horse, one chicken, one pigeon. New species were recently introduced mainly from America—for instance the turkey, native of North America—not to mention the abundance of species that go naturalizing in the order of thousands, introduced, as we mentioned with regard to plants, by speculation, science, and luxury. In this case, too, innumerable are the species that came from Asia, Africa, and America, through man's indirect industry. The world of foreign insects is the one that most forced man to accept a dire tribute. There is no house in Europe now that is not haunted by the cockroach (*Blatta orientalis*) from the Orient; and talking about more elevated animals, a true blight was brought upon our cities with the sewer rat (*Mus decumanus*) from America, but too soon proliferated among us, with the extermination then complete of our old rats (*Mus rattus*). Animals, too, like plants, go to European man, who has become a cosmopolitan man, becoming universal on earth. The silkworm and the bee thus propagated everywhere; horses and oxen of the ancient world wander in endless herds in a state of semi-freedom throughout the immense pastures of South America. Along with man, the pig, the sheep, the goat, the rabbit, the dog, the cat, also became cosmopolitan beings. In every part of the earth, in human settlements pigeons nest, and in the United States as well as in Australia, sparrows proliferate on our roofs.

And not only are animals of the earth and the sky subdued by man, but also the inhabitants of the water: man chases and kills the sperm whale in the boiling waters of torrid lands, as well as whales and seals among the horrid dance of mountains of ice; he kills elephants, gazelles, and ostriches in blazing deserts, and wolves, bears, and chamois on Alpine snows. Fish farming, which repopulates our rivers' and lakes' waters, offers one taste of that dominion that man will increasingly exercise over fish, as he has done for a much longer time with the mammals and birds that are his companions, servants, tools, and food. Nothing, in the end, is safe from this intruder, who exerts his robbery and extends his power over land, air, and water.

We are talking about European man, because Europe, more than other regions, feels man's sovereignty. Home to ancient civilizations, occupied by powerful nations, by men used to multiplying time through the zeal of labour, Europe has felt more than other places the deep footprint of the earth's lord. But the ancient civilizations of Asia and Africa preceded the ancient civilizations of Europe. The civilizations of Peru and Mexico have been lost in the mists of time. Europe, as by regurgitations, now flows over the lands from which its own people originated, and over those that our fathers didn't even know existed. For a long time now this wave of people goes, comes, returns, bumps, and overlaps as sea waves on the surface of the land. Let us not forget, then, that man has been, since his inception, cosmopolitan. Unlike the speechless animals that preceded him on the surface of the planet, he knows no geographical confines, he makes no distinction of zone or of climate; rivers, seas, valleys, and mountain crests are no obstacle to him. As he has been wandering for centuries, naked, through the arenas of the boundless desert, so too, covered in skins torn from animals mild and ferocious, for centuries he has been driving his sled on the horrid labyrinth of polar ices that reflect the meek glow of the northern lights. European man already cast his eye on the heart of this desert, to make an oasis for himself, and is about to drive his banner on the North Pole—the same banner that already waves on the highest Alpine peaks. A day will come, when the earth will be but a seal of man's power, and man a seal of God's, who, giving man his own image, almost gave him a portion of his own creative will.

A new era has thus begun with man. Let us admit, eccentric though it might be, the supposition that a strange intelligence should come to study the Earth in a day when human progeny, such as populated ancient worlds, has disappeared completely. Could he study our epoch's geology on the basis of which the splendid edifice of gone worlds' science was built? Could he, from the pattern of floods, from the distribution of animals and plants, from the traces left by the free forces of nature, deduct the true, natural conditions of the world? Maybe he could—but always and only by putting in all his calculations this new element: human spirit. At this condition, as we, for instance, explain the mounds of terrestrial animals' bones in the deeps of the sea, he, too, could explain the mounds of sea shells that savage prehistoric men built on the coasts that they inhabited. But if current geology, to understand finished epochs, has to study nature irrespective of man, future geology, to understand our own epoch, should study man irrespective of nature. So that future geologist, wishing to study our epoch's geology, would end up narrating the history of human intelligence. That is why I believe the epoch of man should be given the dignity of a separate new era.

Geologists should not be reluctant in accepting this foundation for the only reason of the brevity of time currently encompassed by it. The Anthropozoic era has begun: geologists cannot predict its end at all. When we say Anthropozoic, we do not look to the handful of centuries that have been, but to those that will be. Nothing makes us suspect that Adam's seed might be close to extinguishing; for humanity is too young if compared to that ideal of perfect civilization of which mankind's firstborn has planted the seed, surely not in vain. Although contained by a brief number of centuries, God is willing to concede to the triumph of intelligence and love that the earth will never escape the hands of man if not thoroughly and deeply carved by his prints. The first trace of man marks the beginning of the Anthropozoic era.×

Bios

Valeria Federighi is a practicing architect and a PhD student in Architecture at the Turin Polytechnic, Italy, where she also completed her MArch (2011); she also completed a Master of Science in Design Research from the University of Michigan (2012). Her research has dealt with the possibility of designing for incremental building in Dharavi, Mumbai, and with the role that mediatization plays in the perception of spaces, with a focus on the city of Detroit and the practice of "ruin porn" photography. Valeria's PhD research analyzes practices of living that exploit the slack that exists both in physical, planned space, and in the legal system that attempts to regulate it. Valeria work experience includes internships in San Francisco (AndersonAndersonarchitecture), Mumbai (URBZ), Turin (Isolarchitetti), and an ongoing collaboration with StudioPomero, Turin.

Alex Berceanu is a photographer, graphic designer, and creative director born in Bucuresti, Romania and currently living in Toronto, Canada, where she is completing the undergraduate program for Architectural Design in the Daniels Faculty of Architecture, Landscape and Design, University of Toronto.